

ART. VII.—CASES OF HEMIPLEGIA, ETC.

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THE first of these cases illustrates a difficulty in diagnosis which is not likely to arise very frequently. Not a difficulty in regard to the nature of the lesion, but as to the cause and significance of certain symptoms. The pain and swelling of the joints occurring soon after the hemiplegic symptoms gave rise to a question as to whether they were due to the cerebral lesion, were merely the arthritic complications following cerebral softening, or were the symptoms of rheumatism.

The patient was a business man 60 years of age, who had been actively engaged in business all his life. I was asked to see him by his physician, Dr. Harriman, from whom I learned the history of the case. About two weeks before I saw him, he had an attack of pain in his left side from which he suffered only a short time, but he regained his strength only slowly. Previous to this attack, he had had pain in the left wrist which was slight and attracted but little notice. About a week after the pain in his side he awoke his wife in the early morning by trembling, shaking and sobbing in his sleep. He was awakened with difficulty and said he had had a bad dream. After this the pain in the left side returned. At that time he had no motor nor sensory paralysis. He continued under treatment on account of the pain in his side. The day before I saw him he rose and washed himself, he then lay on the lounge with an arin hanging over its back. The Dr. called to see him, and after a few minutes conversation he attempted to rise to get into bed again but could not support himself, he slipped down and was evidently weak. The left

side seemed most affected. Subsequently the left hand was found to be numb, and was used poorly. No pulse could be detected in the left radial, but could be in the left ulnar. I found him in bed with a rather florid face. The action of the two sides of the face was about equal, though when at rest the face was drawn slightly to the right. The pupils and eyes acted naturally, and the tongue was protruded straight. The arms and legs were moved freely in bed and there was no difference in the two sides, but on rising he could not manage the left leg so well as the right, and the left hand could not be so well directed with the eyes shut as the right. There was evident retardation of sensation in the left hand and left leg. The pulse in left radial was weaker than in right. Heart sounds were normal. With the ophthalmoscope both optic nerves were found rather clouded, the veins only showing well. The light troubled him, and he moved his eyes so much that it was not easy to make the examination.

During the next three or four days he improved, the pulse returned full and strong to the left radial. An examination of the urine showed no albumen and no casts. On the evening of the fourth day, he began to have pain in all the joints on left side, but in especially the hip and knee. He was sleepless and restless, the left side being moved less than right. In the morning, on moving the joints of the left side, the pain was very marked and the joints were tender to touch. When I saw him he was partially under the influence of morphia, but could be easily aroused and the pupils responded to light, when he sank off into a semi-comatose sleep the pupils were contracted. He complained especially of the right hand and right leg as painful under passive motion. The left were also sensitive, but less so than the right. Both ankles were red and swollen, the hands were slightly swollen at the joints and some of them were red. The heart sounds were much muffled, not clear and distinct as at last visit. Respiratory sounds were clear, percussion was obscured by a very tympanitic abdomen. Pulse 114 to 120. Resp. 27. Skin was hot and not very moist though he had perspired before my visit. Temperature was not taken. There was ptosis on the left side, and the facial paralysis was more marked than at the

previous visit. There was no possibility of judging as to the paralysis of the limbs on account of the pain caused by motion.

Two days later he died and at the autopsy made by the attending physician, the right middle cerebral artery was found plugged by a clot, the cerebral tissue was softened, and the arteries at the base were extensively atheromatous. The aorta near the heart had two or three patches of atheroma. The heart was healthy.

The joints may be affected as a consequence of lesion of the nervous system; it is not uncommon to find this in cases of disease of the spinal cord, it is also found in cases of cerebral lesion, though not quite so much attention has been paid to the latter lately, perhaps because the arthritis of locomotor ataxia has been described at only a comparatively recent period.

Charcot has given a description of these cases, though he was not the first to describe them, and it is from his description especially that attention has been attracted to such cases. The arthritic symptoms, according to him, are generally developed from fifteen days to a month after the apoplectic attack, about the time that the late contraction appears; the swelling, redness and articular pains are sometimes as great as is found in acute articular rheumatism. The tendinous sheaths are also often affected. The joints affected are exclusively those of the paralyzed limb, often only those of the upper extremities are affected.

The joint affection in the present case affected both sides, and the lower limbs more than the upper, began at a much earlier date than that given by Charcot, appearing the fourth or fifth day after the occurrence of the hemiplegia. Nothnagel, in Ziemissen's Cyclopedie, is less precise in stating the time when this symptom may appear; he says it may begin from a few days to four weeks after the hemorrhage. As he says nothing about his own observations, but refers to Charcot and others, it would probably be proper to consider Charcot's statement as the correct one. Then in the present case, the time at which the arthritis appeared would exclude the cerebral origin of the lesion. When the patient was first seen

little importance was given to the pain in the wrist, because it was so slight. It is not improbable that it was the first symptom of a rheumatic attack, and if so, the subsequent joint affection would belong to the same.

The pain in the wrist and the affection of the joints of the non-paralyzed side, would confirm the diagnosis of rheumatism. My notes make no mention of the nature of the pain in the side, excepting that the physician spoke of it as pleuritic.

My diagnosis, when I first saw the patient, was embolism; on the second visit after the joint affection had developed, I considered the case rheumatic, with probably the formation of a clot in the heart. The febrile state at the second visit did not assist in the diagnosis, as it might be present if there was no rheumatism; but the reported sweating rather confirmed the existence of rheumatism. The autopsy showed the correctness of the diagnosis of embolism, but could not decide as to the existence of rheumatism.

In contrast to this, so far as relates to the arthritic symptoms, may be placed a case in which the affection of the joints was undoubtedly due to the cerebral lesion. The arthritis did not appear until a much longer time subsequent to the paralysis, and was confined to the paralyzed limbs. The case is likewise interesting, as there were cerebral symptoms preceding the definite attack by a long time, but apparently not serious enough to give rise to much apprehension. I was inclined to look upon the case as one of obstruction of an artery by thrombosis, giving rise to softening, possibly several small arteries were thus occluded at different times.

Mr. A. was seen in April the previous summer, and in November, and again in January he had had attacks of cerebral disturbance, that in the summer being less severe than the others. The disturbance consisted in a difficulty in collecting and arranging his thoughts; he could follow one train of reasoning, but could not combine it with others. In the last attack he made absurd mistakes when dressing, getting his clothes upside down. In January, he fell once or twice, has had some headache, not much dizziness, rather confusion of mental power. He went away for a rest, but per-

sisted in using his brain, engaging in considerable mental work. About three days before I saw him after speaking in public, on going on the street he was dizzy, and later the left index finger felt numb. He denied being dizzy often, yet in the next breath said he was never attacked while speaking, or excited in debate, only afterwards; and several times he spoke as if he had frequent attacks of discomfort in his head. Two days before I saw him he rose and dressed; later, he fell on the floor. There was weakness of the left leg, the face was drawn a little to the right, the tongue was protruded straight, the pupils acted well, the eyes moved naturally, the left hand was weaker than the right, and there was diminished sensitivity in the left hand. The mind was evidently weakened, and he was rather childish; he could not keep his eyes steady for examination. Afterwards the cerebral symptoms became more severe. I saw him only once, and several weeks later he died. Before death the joints, especially the knee and hip of the paralyzed side, were the seat of very severe pain; there was very little swelling, if any. There was no autopsy.

Another form of trophic change after cerebral lesion, causing hemiplegia, and which is rare, was seen in the following case.

Mrs. B. was first seen September, 1874; she had had considerable trouble, and was much depressed by her husband's death. Four or five weeks previously she had taken a long ride in the rain, with the wind blowing upon the left side of her face. Immediately after the face was drawn to the right, the left eye could not be closed. When seen there was left facial paralysis, all the branches of the seventh being affected, the eye not closed. At that time she said she never had had any trouble in hands or feet, but was not as strong as formerly; had no tingling, pricking, nor numbness in limbs. The sensation of the face seemed the same on both sides, eyesight was not affected; no diplopia; tongue protruded straight; no difficulty in deglutition, nor in respiration; taste was retained on both sides. The reaction of the facial muscles on the left to the faradic current was quite lost, excepting a very slight action about the mouth. The muscles on left of face responded to eight cells, slightly to six. Subsequently, she complained

occasionally of being "dizzy in her legs and weak." She was troubled very much with dryness of the mouth. She recovered the ability to close the eye, excepting a very narrow chink. The face, when at rest, looked nearly natural, and yet later there was scarcely any distortion during conversation.

This was undoubtedly an ordinary case of facial paralysis from exposure to cold. The paralysis of the upper branch of the facial, the loss, complete and early, of the faradic contractility, the absence of other symptoms, sufficiently indicate that the lesion was in the course of the nerve.

In January, 1877, I was called again to see her, by the advice of Dr. Reynolds. She said she had been feeling unusually well until September, when, after taking a bath, without pain, without loss of consciousness, without previous headache, dizziness, or "sleepy" sensation, she lost the use of her left hand, and soon after the left leg, and she slid down gently. After a while she gained power to walk; the power of using the hand was recovered only very slowly. When seen in January, all the motions of the hands and fingers were possible but were executed slowly, excepting that the hand could not be fully closed. The power of grasping was not strong, but with the fingers half flexed there was considerable power in pulling. To the faradic current the muscles acted generally less readily than on the opposite side, especially the extensors and the flexors, the interossei responded better, the extensor indicis and abductor pollicis very poorly, the flexors of the fingers very poorly also, but the flexors of the wrist well; the biceps acted poorly. The muscles of the leg were not compared with the opposite side, but their reaction was evidently below the normal, especially so in the case of the tibialis anticus. The left arm was very much smaller than the right, and the left leg was somewhat diminished in size. There was slight contraction of the extensor muscles of the fingers, preventing complete flexion, otherwise no contraction.

It is stated by nearly all authors, that after cerebral lesion the electrical reaction of the muscles is normal, and there is comparatively little or no wasting of the muscles. When hemiplegia, however, occurs in childhood, there may be retarded development, and hence one side may become larger

than the other. In this third case, there was a very unusual disturbance of nutrition. The first attack was clearly simple facial paralysis from exposure, and ran its regular course. It would hardly seem possible that there should have been any connection between the two attacks. The second attack, judging from the patient's account and from the account given by her physician, as well as by the general course of the symptoms, was clearly of cerebral origin, probably was a hemorrhage. After several months there is found atrophy of the arm and leg, and decided loss of electrical reaction in certain muscles, this loss of electrical reaction being greater in the leg than in the arm.

There have been two cases, similar in this respect, reported, both with autopsies; one by Charcot (*Legons sur les maladies du systeme nerveux t. I.*; 1872, p. 55), the other by A. Pitres (*Arch. de Physiol.*; 1876, p. 657). In both of these there was descending secondary degeneration of the lateral columns, and in both there was found also destruction of the cells of the anterior cornu on the paralyzed side. In both there was contraction of the paralyzed muscles. In the present case there was a slight contraction, though not of the flexors as is most common, but of the extensors. It is reasonable to conclude, that with secondary sclerosis of the lateral columns, there has been also destruction of some of the cells of the anterior horn. It is not so easy to recognize slight contractions in the foot as in the arm; but as the patient walks very slowly with short steps, with more apparent feebleness than the amount of paralysis would account for, there may well be a degree of stiffness dependent upon muscular contraction of the muscles of the leg. The loss of electrical reaction being greater in the leg than the arm, would indicate that the cells in the lumbar enlargement are more extensively affected than those of the cervical.

In striking contrast with this condition of the arm and leg is that of a young woman who, twenty months ago or more, had an attack of right hemiplegia with aphasia. After about three months the aphasia slowly disappeared and partial power was recovered over the limbs, but then began to appear a contraction of the fingers, hand, and fore-arm of the affected side.

There has been for more than a year almost entire loss of voluntary control over the hand and fingers; the fingers are almost constantly closed, though they can be extended passively. Now, after these many months of such entire paralysis, the affected arm is larger than the other by nearly a quarter of an inch, and all the muscles respond readily to electricity, showing that the nutrient or trophic cells in the anterior cornu are not affected.

It may be well to add, that after long-continued but rather irregular treatment with electricity, there was decided improvement in the case of Mrs. B.; the muscles responded more readily to electricity, but not quite so well as those of the sound side. Considerable power was regained, and much of the tremor disappeared.

A Case of Lesion of the Facial Nerve with Anomalous Electrical Reaction.

The following case is of interest owing to the anomalous reaction of the muscles to electricity. The usual result of an injury to a nerve is, immediate loss of voluntary control over the muscles supplied by that nerve; later, loss of reaction in both nerve and muscles to the electrical stimulation. The power of the will generally returns first, or at the same time, with the return of the power of reacting to electricity.

E. S. was first seen at the City Hospital, in the Department for Nervous Diseases, in April. The history she gave was, that four years ago she had a tumor removed from the left side of her neck, just below the ear. There is a scar at that place, just behind the angle and ramus of the jaw. She said that her face was subsequently drawn over to the right. When seen, there was partial paralysis of the left side of the face, the will having scarcely any control over the muscular action; the left eye could be only partially closed. All the muscles responded to a strong faradic current, when the electrode was applied directly to the muscles. When the electrode was placed behind the scar, *i. e.*, over the proximal end of the nerve with reference to the seat of the lesion, all the muscles

of the face acted to a current of moderate intensity; when the electrode was placed in front of the scar, over the distal end of the nerve, a very strong current was required to excite contraction in the muscles. When a current that merely caused slight contraction, as applied in front of the scar, was used behind the scar, very violent contractions of the facial muscles were produced. This peculiarity was noticed several times at intervals of weeks.

This case would give support to the views lately advanced, that nerve fibres may be capable of conducting an irritation when they are not in a state to respond to an irritation—the receptive function is a different one from the conductive. Here the nerve fibres were regenerated sufficiently to convey the stimulus afforded by the electricity when applied to the healthy nerve, but they were not in a condition to readily receive that stimulation directly.

Under treatment, there was considerable improvement in the power of the will over the muscles, and the eye could be nearly, or at times quite closed, but there was no change in the above electrical reactions while the patient was under observation.
